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**PREDICTING CIGARETTE INITIATION AND RE-INITIATION AMONG ACTIVE DUTY AIR FORCE
RECRUITS**

**Little, M.A., Ebbert, J.O., Krukowski, R.A., Kalpinski, R., Patten, C., Klesges, R.,
and Talcott, G.W.**

ABSTRACT

Introduction: The first year of military service in the Air Force is a particularly vulnerable time for tobacco use. All enlisted Air Force recruits are required to remain tobacco free for the first 12 weeks. Despite the fact that a majority of Airmen express confidence that they will not use tobacco, most will return to smoking and many nonsmokers initiate once the ban is lifted. Understanding the factors associated with cigarette smoking initiation among non-users and re-initiation among former users is critical for the development of successful tobacco use interventions.

Methods: The current study examines patterns of cigarette smoking among a sample of 2,395 Air Force over their first year of service. Logistic regression analyses examined associations between baseline predictors and initiation and re-initiation of cigarette smoking at a one-year follow-up.

Results: Results: Compared to never tobacco users, the strongest predictor of initiation was having owned cigarette-branded merchandise (OR 3.81, 95% CI 1.67, 8.71). Compared to former users who did not re-initiate tobacco, the strongest predictor of re-initiation was intention to use tobacco (OR 2.08, 95% CI 1.53, 2.83). Compared to tobacco initiators, the strongest predictors of re-initiation were prior tobacco use and intentions to use tobacco (ORs range 1.85 to 4.63).

Conclusions: The current findings suggest there are multiple risk factors associated with initiation and re-initiation of tobacco use. These findings can be used to tailor interventions to prevent initiation and re-initiation of tobacco use in the U.S. military.

INTRODUCTION

Tobacco use is prevalent among US military personnel. Twenty-four percent of active duty military personnel report current cigarette smoking compared to 18% in civilian populations.^{1,2} The Department of Defense is the nation's largest employer with 1.4 million active duty personnel,³ and each year the Department of Defense spends an average of \$1.6 billion treating tobacco-related morbidity among active duty military personnel (e.g., medical care, hospitalizations, lost work days). With more than 250,000 individuals leaving the military each year,⁴ many will continue their tobacco dependence into their civilian lives. Advancing our understanding of factors that impact tobacco use among active duty military personnel will identify opportunities for prevention and intervention to improve US public health.

Within the "lifespan" of an active duty member, the first year after military enlistment is a particularly vulnerable stage. Approximately 220,000 new recruits enter the military annually.⁵ Among Air Force personnel prior to enlistment, recent studies have found that the prevalence of tobacco use was much higher than that of the general population.^{1,6} For instance, the prevalence of hookah use was four times higher than young adults in the civilian population aged 18-24, while the prevalence of e-cigarettes was four times higher than the national average.^{1,6} In addition, among cigarette smokers, 31% were dual (2 types of tobacco) and 44% were poly tobacco (≥ 3 types of tobacco) users. However, throughout the 8 ½ weeks of Basic Military Training (BMT), Air Force recruits are required to remain alcohol and tobacco free.

Following successful completion of BMT, recruits become Airmen (they are called Airmen regardless of gender or rank) and go to Technical Training where they acquire the skills for their designated job in the Air Force (e.g., aircraft maintenance). For the first 4 weeks of Technical Training, Airmen are required to maintain the ban on alcohol and tobacco products. During this

period, research indicates that 63.0% of Airmen report they are “completely confident” they will remain tobacco free.⁶

Unfortunately, the majority of former smokers return to smoking during Technical Training.⁷ Furthermore, in a longitudinal study of tobacco use among during their first service year, Airmen were 500% more likely to harm escalate (e.g., switching from smokeless tobacco use to dual use) than harm reduce (e.g., cigarette smoking to smokeless tobacco use or smokeless tobacco use to total cessation) at follow-up.⁸ Furthermore, as much as 15% of active duty personnel initiate cigarette smoking after enlistment into the military.⁹ These high rates of use are occurring despite established anti-tobacco regulations on all military bases and an intent among the majority of Airmen to remain tobacco free. Little is known about the factors in the training environment that lead to tobacco use.

While a large body of research exists examining smoking initiation among adolescents,¹⁰ few studies¹¹ have examined factors influencing tobacco use among military personnel. Green et al., found that Airmen were more likely to initiate tobacco if they perceived smoking to be normative among their peers, their roommate smoked, or their Military Training Leaders or instructors used tobacco.¹¹ This cross-section study, however, was not able to assess what Airmen baseline characteristics predicted tobacco initiation and re-initiation. A need exists to deepen our understanding of the factors associated with smoking following enlistment in order to develop effective interventions that decrease the onset of tobacco use for Airmen in Technical Training. Previous attempts to prevent tobacco initiation among Airmen have been largely unsuccessful.^{12,13}

The current study sought to fill a gap in the tobacco literature by examining why following a period of 12.5 weeks of forced abstinence, some individuals decide to start smoking for the first time and some prior cigarette users quit smoking when evaluated 12 months after joining the Air Force. We assessed the characteristics of 2,395 new Air Force enlistees and their patterns of cigarette use to determine the factors associated with cigarette smoking abstinence, initiation, and re-initiation.

The current study is a first step in understanding how to reduce tobacco use during Technical Training.

METHODS

Participants and Procedures

Study participants were 6,769 US Air Force Technical Trainees from Joint Base San Antonio, TX between March 2011 and July 2013. During the first week of Technical Training Airmen receive educational interventions as part of the transition from BMT to Technical Training, and we have access to every Airmen. We conduct a group-based brief alcohol intervention,¹⁴ which has become part of this curriculum, and it was during this time that we consented for the current study.

Airmen were convened by squadron in groups of approximately 50 Airmen. After the alcohol intervention, we presented 8,943 Airmen with a description of the study. Over 76% of Airmen consented to participate and completed the baseline questionnaire (N= 6,880).

Approximately one-year after completing the baseline questionnaire, Airmen were contacted for follow-up. Of the 6,880 Airmen completing the baseline questionnaire, 49.6% (N=3,355) were eligible for follow-up, 39.4% (N=2,777) were ineligible, 10.3% (N=698) were terminated, and 0.01% (N=50) withdrew from the study. Airmen were ineligible for follow-up if they were not active duty (i.e., National Guard (n= 655) or Reserve (n=694)), stationed overseas (n=1,142), deployed (n=282) or switched to a different branch of the military (n=4). Airmen were terminated if they had separated from the Air Force (n=680), were deceased (n=16) or incarcerated (n=2).

One month prior to projected follow up date, a list of consented participants was sent to the Defense Manpower Data Center. The Defense Manpower Data Center maintains the largest archive of personnel data in the Department of Defense. Defense Manpower Data Center returned the list with current contact information for participants. Participants were contacted by email and phone

to complete the follow up. The one-year assessment was completed by N= 2,395 (71.4%) of Airmen eligible for follow up with 97% of participants responding by phone (N=2,323) and 3% responding by email (N=72). Our final analytic sample included 2,188 Airmen with complete cigarette use data from both the baseline and one-year follow-up. This protocol was approved by Wilford Hall Ambulatory Surgical Center Institutional Review Board.

Baseline questionnaire

The questionnaire assessed four domains: (1) demographics, (2) prevalence of tobacco use (e.g., cigarettes, smokeless tobacco, and cigars), (3) intrapersonal factors (e.g., perceived harm), and (4) interpersonal factors (e.g., peer use).

Demographic variables included *age* (i.e., < 21 , , ≥ 21 years old), *body mass index* (BMI; weight/height²), *gender* (i.e., female, male), *marital status* (i.e., not married, married), *ethnicity* (i.e., non-Hispanic, Hispanic), *race* (i.e., white, black, Asian, Other, Multiple Races), *education* (i.e., high school graduate/G.E.D. or vocational training after high school, at least some college), and *residence prior to BMT* (i.e., South, Northeast, Midwest, West).

Tobacco use prevalence was assessed by asking Airmen their history of using cigarettes, smokeless tobacco, or cigars prior to BMT because the Airmen were still tobacco free when surveyed. As such, prior to BMT was the last time they had the opportunity to use these products. Response options for tobacco ranged from “I smoked/used (tobacco product) every day and I smoked/used (tobacco product) xx (amount) per day/per week”, “I didn’t use (tobacco product) every day, but I used at least once a week”, “I didn’t use (tobacco product) every week but I used at least once a month”, “I used (tobacco product) less than once a month”, “I didn’t use (tobacco product)”, “I used (tobacco product) but quit prior to BMT”. Pre-BMT history of cigars and smokeless tobacco were recoded into dichotomous variables (i.e., did not use, any use (including quit prior to BMT)). *Dual use* was defined as a

history of using two tobacco products prior to BMT (i.e., No, Yes). Never use at baseline was defined as no use of a tobacco product prior to BMT.

To assess intrapersonal factors, Airmen were asked about intentions to use tobacco, perceived harm of tobacco and beliefs regarding tobacco. Intentions were assessed through three items: intentions to use tobacco after Technical Training (i.e., plan to remain tobacco free, thinking about using tobacco, definitely will use tobacco), and *use product that claims to be safer than cigarettes* (i.e., No, Yes), and *will use tobacco to help me meet weight standards in the military* (i.e., No, Yes). Beliefs were assessed by asking Airmen if they agree that *Tobacco restrictions in BMT/Technical Training are a great way to keep people tobacco free* (Strongly disagree = 1 to Strongly agree = 5). Lastly, Airmen were asked if they owned at least one item (e.g., t-shirt, hat) with cigarette advertising on it (i.e., No, Yes).

Interpersonal factors were assessed by asking Airmen about peer, BMT Military Training Instructors (MTIs) and family/roommate use. *Peer use* was created by taking the mean of three items that assessed how many of their closest friends used each tobacco product (cigarettes, smokeless tobacco or both) from “None” to “Almost all, 80% or more” (3 items; $\alpha = 0.79$). *BMT Military Training Instructor use* was created by taking a mean of three items that asked Airmen the number of BMT MTIs who used each tobacco product (cigarettes, smokeless tobacco or both) (“I don’t know”, “None,” “Almost all, 80% or more” (3 items; $\alpha = 0.78$)). *Family/Roommate use* was assessed by asking Airmen if they lived with someone who regularly used (cigarettes, smokeless tobacco or both) prior to BMT (No, Yes).

Follow-up Questionnaire

Tobacco use prevalence was assessed by asking Airmen about their cigarette use over the past 12 months since joining the Air Force. Response options included “I didn’t smoke cigarettes”, “I smoked cigarettes every day”, “I don’t smoke cigarettes every day but

smoked at least once a week”, “I don’t smoke cigarettes every week but smoked at least once a month”, and “I smoked cigarettes but less than once a month”. Airmen were also asked if they started smoking in the past 12 months and, if they did, when they began (e.g., Technical Training, On leave, First Duty Assignment, Deployment, Other).

Statistical analysis

Descriptive statistics of key demographic and tobacco variables were computed separately by cigarette use status at the one-year follow-up. We created four cigarette use status categories: (1) *never users* were defined as no cigarette use prior to BMT and no cigarette use in the previous 12 months at the one-year follow-up (N=1,422, 65.0%); (2) *initiators* were defined as no cigarette use prior to BMT and at least some (i.e., less than monthly to daily) cigarette use in the previous 12 months at one year (N=204, 9.3%); (3) *former users* were defined as lifetime use prior to BMT and no cigarette use in the previous 12 months at one year (N= 210, 9.6%); and (4) *re-initiators* were defined as lifetime use prior to BMT and at least some cigarette use in the previous 12 months at one year (N=352, 16.1%). Differences in proportions of demographic variables across user groups were calculated using ANOVA for continuous variables and χ^2 test for categorical variables.

Logistic regression analyses were conducted to examine associations between baseline predictors and cigarette smoking at the one-year follow-up. The associations were examined in three comparisons: (1) initiators vs. never users; (2) re-initiators vs. former users; and (3) re-initiators vs. initiators. Across all comparisons, in the first step of our analyses we established four sets of predictors, including (a) 9 demographic predictors, (b) 3 tobacco use history predictors, (c) 5 intrapersonal predictors, and (d) 3 interpersonal predictors. Next we ran logistic regression models separately by level of influence across the comparisons predicting cigarette smoking at the one-year follow-up. In the final step we ran logistic regression models for each of the comparisons in which we entered predictors across the predictor sets that were significant at $p < 0.10$ in the second step

(Table 2) as well as all demographic predictors. Associations were considered significant at the alpha level of 0.05. Data were analyzed using SAS version 9.4 (SAS Institute, Cary, NC).

RESULTS

Prior to BMT, 74.3% of Airmen were never tobacco users and 25.7% reported lifetime use of cigarettes. At the one-year follow-up, 25.4% of Airmen reported cigarette use over the previous 12 months. Among all participants (N=2,188), 65.0% (N=1,422) were never users at follow-up, 9.6% (N=210) remained former users, 9.3% (N=204) were initiators, and 16.1% (N=352) were re-initiators. Among never users at baseline, 87.5% (N=1,422) remained never users at follow-up and 12.6% (N=204) were initiators. Among lifetime users, 37.4% (N=210) remained former users and 62.6% (N=352) were re-initiators. Over half (54.2%) of Airmen who reported smoking cigarettes at follow-up, reported initiation or re-initiating during Technical Training, while over a quarter (27.8%) reported using tobacco at their first duty assignment (see Figure 1). No significant differences were observed in location of first use between initiators and re-initiators ($\chi^2 = 7.83$, $df = 4$, $P = 0.10$).

Comparisons between baseline characteristics across the four user categories are presented in Table 1. Initiators tended to be younger, male, non-white and have less education compared to the other users categories (all p 's < 0.05). Never users reported less tobacco use, had lower intentions to use tobacco, were less likely to own cigarette branded merchandise, and were less likely to report peer use, MTI use and history of living with a tobacco use compared to the other users categories (all p 's < 0.05). Additionally, compared to the other users categories, never users were more likely to believe that tobacco restrictions in training promote abstinence ($p < 0.0001$).

Table 2 presents results from the logistic regression models examining sets of predictors of cigarette initiation and re-initiation at the one-year follow-up with significance set at $p < 0.10$. Compared to never users, initiators were more likely to be male, under 21, more than one race, have

smoked cigars prior to BMT, intend to use tobacco after Technical Training, intend to use a product that claims to be safer than cigarettes, believe that tobacco will help them meet weight standards in the military, own cigarette branded merchandise, and report peer use of tobacco (all p 's < 0.10). They are less likely to agree that tobacco restrictions in training promote abstinence (p < 0.10).

The results of the analyses comparing cigarette re-initiators and former users showed that re-initiators were more likely to be under 21, have a lower BMI, have higher intentions to use tobacco, and have previously lived with a tobacco user (all p 's < 0.10). Additionally, they were less likely to believe that tobacco restrictions in training promote abstinence and report MTI use compared to former users (all p 's < 0.10).

Compared to initiators, re-initiators were more likely to be married, non-Hispanic, previously used smokeless tobacco and smoke cigars, report dual tobacco use, intend to tobacco after Technical Training, use a product that claims to be safer than cigarettes, report peer use of tobacco, and have previously lived with a tobacco user. Initiators were also less likely to be Black, and believe that tobacco restrictions in training promote abstinence (all p 's < 0.10).

Table 3 presents the results of the final multivariate models including marginally significant predictors from the factor models at p < 0.10 as well as demographic predictors. In the final model comparing initiators with never users, initiators were more likely to be male, other race or more than one race, have smoked cigars prior to BMT, use a product that claims to be safer than cigarettes, use tobacco to meet weight standards in the military, and own cigarette branded merchandise (all p 's < 0.05). Initiators were also less likely to agree that tobacco restrictions in training promote abstinence compared to never users (p < 0.05). Results of the final model comparing re-initiators and former users showed that re-initiators were more likely intend to use tobacco after Technical Training and have a lower BMI as well as less likely to report MTI use and agree that tobacco restrictions in

training promote abstinence compared to former users (all p 's < 0.05). Comparing initiators to re-initiators, re-initiators were more likely to be female, have used smokeless tobacco prior to BMT, report dual tobacco use, intend to tobacco after Technical Training, and used a product that claims to be safer than cigarettes (all p 's < 0.05).

DISCUSSION

In the current study, we observed one year after BMT, 65.0% of Air Force enlistees remained never smokers, 9.6% remained former users, 9.3% initiated cigarette smoking, and 16.1% restarted cigarette smoking. In this cohort, 12.6% of never smokers initiated cigarette smoking and 62.6% of former users restarted smoking. More than half of this initiation and re-initiation occurs during Technical Training which is soon after the tobacco ban is lifted. Previous studies have reported that as much as 15% of active duty personnel initiate cigarette smoking after enlistment into the military.⁹

We observed that males were more likely to be initiators while females were more likely to be re-initiators. Interestingly, having a lower BMI was predictive of re-initiation, perhaps indicating a concern about post-cessation weight gain. Cigarette smokers commonly report smoking to control body weight.¹⁵ Smoking reduces aging-related weight gain which results in larger differences in body weight between smokers and non smokers.¹⁶ Previous focus groups conducted with military populations have reported that smoking was viewed as an effective method to avoid weight gain.¹⁷ Similarly, believing that tobacco would assist an individual in meeting the weight standards in the military was predictive of smoking initiation. Military personnel are required to pass a fitness test each year as part of their annual performance evaluation. Failure results in probation and possible discharge from the military. Given the severity of the punishment, it is not surprising that Airmen will engage in unhealthy behaviors in an attempt to meet the requirements. Unfortunately, cigarette use impairs military readiness through diminished physical performance and endurance long-term.¹⁸

Willingness to use a tobacco product that claims to be safer than cigarettes as well as lifetime use of other tobacco products were associated with both initiation and re-initiation. Previous research has found a high prevalence of dual and poly tobacco use among Air Force recruits.¹⁹ Over half of tobacco users reported using more than one tobacco product, and the most common combination of three products was cigarettes, cigarillos and hookah.¹⁹ Unfortunately, there is very little know about treating dual and poly tobacco use dependence, and even less is known about these behaviors in the military. The current study was limited to an examination of cigarette smoking initiation and re-initiation. Given that rates of smokeless tobacco (8.5%), hookah (10.5%), cigarillos (8.7%), and e-cigarettes (5.9%) have increased among recruits entering the military,⁶ future studies should identify factors associated with initiation and re-initiation of all types of tobacco, including dual and poly tobacco use.

Owning cigarette branded merchandise prior to joining the Air Force was predictive of cigarette smoking initiation. Previous research has consistently observed that owning cigarette branded merchandise is a strong predictor of smoking initiation among adolescents.^{20,21 22,23} Previous studies have also found that receptivity to tobacco branded merchandise was a stronger predictor than peer use.^{21,22} Consistent with this research we found that the relationship between peer use and cigarette initiation was confounded by owning cigarette branded merchandise, such that in the final multivariate model peer use was no longer significant after controlling for owning cigarette branded merchandise. Previous researchers have hypothesized that peer smoking may have only a proximal and short-lived influence on smoking behaviors among adolescents and young adults.²² Most Airmen in Technical Training are emerging adults, in a transitional phase where there is a strong desire to establish their personal identity.²⁴ Owning cigarette branded merchandise may influence and solidify one's identity that includes smoking as a central component, which could be further reinforced through peer and role model identification in the short term.²²

In the limited previous research examining correlates of tobacco initiation and re-initiation in Technical Training, researchers observed that peer and role model (i.e., Military Training Leaders and Instructors) perceived norms were associated with initiation and re-initiation.¹¹ We found that not knowing whether one's Military Training Instructor used tobacco had a protective effect. According to Air Force Education and Training Command Instruction 36-2909, Military Training Instructors are not allowed to use tobacco in the presence of trainees. Our findings support this policy and demonstrate the effectiveness of the policy on preventing initiation. Other branches of the military have similar policies to prevent tobacco use during their Technical Training.

The current study is the first to analyze predictors for tobacco initiation and re-initiation following the military tobacco ban. Although the current sample is representative of Air Force Technical Trainees, and although the Air Force is the 2nd largest service branch in the US, our findings may not generalize to other branches of the US military.

The current study provides important information, which can be used to develop effective interventions to reduce tobacco use in the military. While previous studies have had success in reducing re-initiation,^{12,13} they have been unable to impact the significant amount of tobacco initiation that occurs in the military. Our results provide clear behavioral targets for future intervention efforts. We observed that compared to re-initiators, initiators had lower intentions to both use tobacco after Technical Training and use a product that claims to be safer than cigarettes. Previous research has found that intentions to use tobacco are a reliable indicator of future use.²⁵⁻²⁸ However, among this sample of initiators, there is a disconnect between their intentions to remain tobacco free (76% planned to remain tobacco free) and their behavior. Future research is needed to understand what in the Technical Training environment is altering these Airmen's intentions given that the majority of initiation is occurring during Technical Training. Interventions could focus on strengthening Airmen's resolve to remain tobacco free early in their training. One possible way to do

this is through brief, group-based interventions, focusing on benefits associated with being tobacco-free and avoiding costs of tobacco use, an approach incorporating principles of behavioral economics.²⁹ For instance, one could begin by eliciting Airmen's short and long-term goals and then follow it with a discussion about how tobacco use aligns with their goals. This type of approach has shown promise in reducing perceived harm and intentions to use tobacco in the short-term.³⁰

Owning cigarette branded merchandise was the strongest predictor of initiation. We hypothesized that this could be because Technical Training is a transitional period when Airmen establish their identities. Interventions to reduce initiation among this population could employ several established behavioral change techniques, such as highlighting the discrepancy between the identity of being a smoker and other aspirational identities as well as identifying positive role models and highlighting their non-smoking status.³¹

With the growing prevalence of other tobacco products^{6,32} and dual and poly tobacco use¹⁹ among this population, future studies should also expand the scope of tobacco interventions to include the range of tobacco products used by Airmen. This is particularly important for developing effective interventions. Reducing cigarette use without accounting for other tobacco product use is not sufficient; prevention and cessation efforts must address contemporary patterns of use.¹⁹

Finally, given the significance of several weight-related predictors, it is important that efforts to reduce tobacco use also address weight concerns. Adding a weight management component to Technical Training that includes correcting cognitive misperceptions as they relate to smoking, fitness and body weight as well as helping them develop healthy habits related to nutrition, will improve not only smoking rates but also the overall health of the Air Force.

Developing effective interventions tailored to this underserved population during a high-risk period for tobacco initiation necessitates a deeper understanding of the predictors associated with initiation and re-initiation among military recruits. Given that Airmen have been tobacco free for BMT

and the beginning of Technical Training, this period could be a teachable moment when tobacco interventions might be more effective.³⁰

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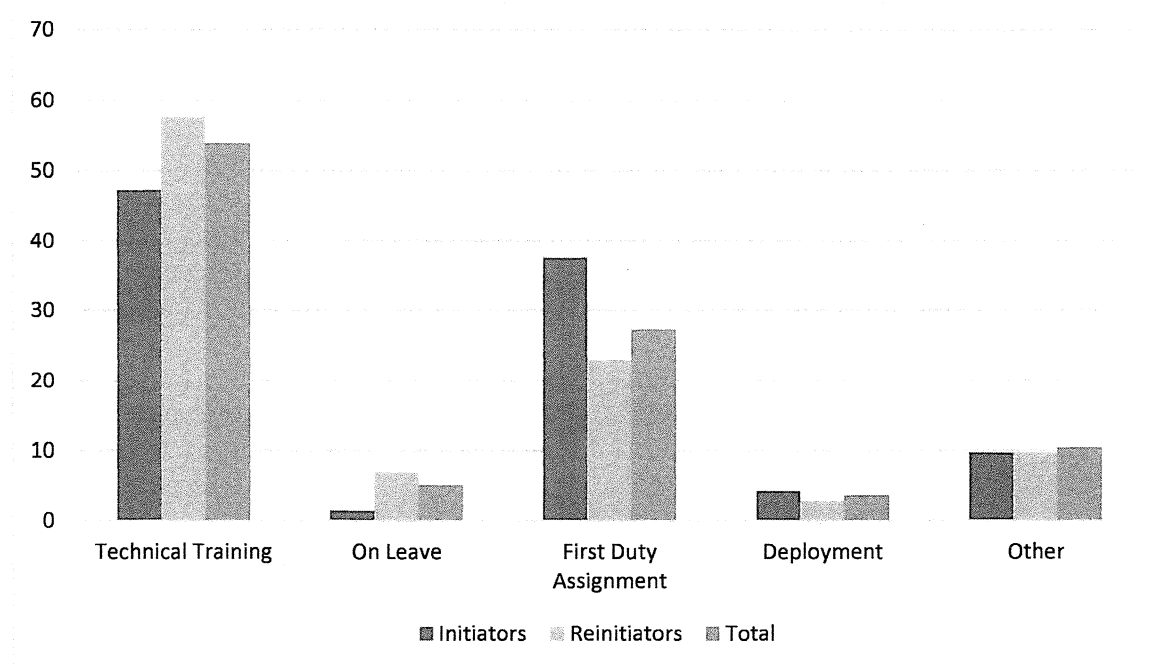
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Figure 1. Location of Initiation/Re-Initiation Following Basic Military Training



Notes. We found no significant differences between location of first use between initiators and re-initiators ($\chi^2 = 7.83$, $df = 4$, $P = 0.10$).

Table 1. Baseline Characteristics by Cigarette User Groups at One Year Follow-up (N=2,188)^a

| | Never users (N=1880) | Initiators (N=305) | Former users (N=275) | Re- Initiators (N=492) | p-val |
|--------------------------------------|----------------------------|-----------------------|----------------------------|------------------------------|-------|
| Demographic Factors | | | | | |
| Over 21 | 40.30% | 27.94% | 47.14% | 37.22% | 0.001 |
| Male | 72.36% | 81.37% | 77.62% | 79.55% | 0.001 |
| BMI ^b | 24.16(2.52) | 24.08(2.46) | 24.44(2.55) | 24.02(2.15) | 0.251 |
| Married | 12.17% | 6.90% | 15.71% | 12.22% | 0.051 |
| Hispanic | 13.84% | 18.81% | 14.83% | 10.54% | 0.051 |
| Race | | | | | <.001 |
| White | 66.83% | 65.84% | 78.85% | 77.27% | |
| Black | 17.22% | 12.87% | 5.77% | 5.68% | |
| Asian | 3.67% | 2.97% | 1.92% | 3.13% | |
| Other | 5.43% | 7.92% | 7.21% | 5.11% | |
| More than one race | 6.85% | 10.40% | 6.25% | 8.81% | |
| Some college | 52.19% | 38.73% | 49.52% | 43.18% | 0.001 |
| State of residence prior to BMT | | | | | 0.381 |
| South | 40.18% | 38.42% | 39.61% | 36.23% | |
| Northeast | 13.21% | 15.76% | 12.08% | 16.23% | |
| Midwest | 20.83% | 23.65% | 27.54% | 25.22% | |
| West | 25.28% | 21.67% | 20.29% | 21.74% | |
| Played sports in high school/college | 67.94% | 63.24% | 67.62% | 64.77% | 0.441 |
| Tobacco Use History | | | | | |
| Pre-BMT smokeless tobacco use | 7.52% | 11.27% | 38.10% | 36.08% | <.001 |
| Pre-BMT cigar use | 13.79% | 29.41% | 52.86% | 51.85% | <.001 |
| Dual use (2 products) | 6.47% | 12.75% | 36.67% | 40.63% | <.001 |

| Intrapersonal Factors | | | | | |
|---|------------|------------|------------|------------|-------|
| Intentions to Use Tobacco After Technical Training ^{bc} | 0.10(0.37) | 0.29(0.55) | 0.40(0.66) | 0.80(0.71) | <.001 |
| Will use product that claims to be safer than cigarettes | 2.75% | 11.82% | 26.67% | 42.74% | <.001 |
| Will use tobacco to help me meet weight standards in the military | 1.48% | 9.31% | 12.44% | 28.69% | <.001 |
| Tobacco restrictions in training promote abstinence ^{bd} | 3.91(1.11) | 3.49(1.22) | 3.45(1.22) | 2.91(1.27) | <.001 |
| Own cigarette branded merchandise | 1.55% | 5.39% | 4.76% | 8.24% | <.001 |
| Interpersonal Factors | | | | | |
| Peer Tobacco Use ^{be} | 1.03(0.87) | 1.29(0.91) | 1.84(0.98) | 1.72(0.87) | <.001 |
| Military Training Instructor Tobacco Use ^{bf} | 0.60(0.81) | 0.60(0.89) | 0.88(1.11) | 0.70(0.93) | 0.001 |
| Lived with Tobacco User Prior to BMT | 43.88% | 48.04% | 55.71% | 62.22% | <.001 |

^a All figures are percentages, unless otherwise noted.

^b Mean (standard deviation)

^c Responses range from 0 to 2.

^d Responses range from 1 to 5.

^e Responses range from 0 to 4.

^f Responses range from 0 to 5.

P-values calculated with ANOVA for continuous variables and χ^2 calculated for categorical variables.

Table 2. Logistic Regression Analyses Using Baseline Characteristics to Predict Cigarette Smoking Status at the One Year Follow-up

| | Initiators vs. Never Users OR (95% CI) | Re-Initiators vs. Former Users OR (95% CI) | Re-Initiators vs Initiators OR (95% CI) |
|--|---|---|--|
| Model 1: Demographic Predictors | | | |
| Over 21 | 0.70(0.47,1.04) | 0.64(0.42,0.98) | 1.30(0.82,2.07) |
| Male | 1.87(1.26,2.76) | 1.18(0.76,1.83) | 0.79(0.49,1.26) |
| BMI | 0.99(0.93,1.05) | 0.92(0.85,1.00) | 1.00(0.92,1.08) |
| Married | 0.60(0.33,1.11) | 1.00(0.58,1.72) | 1.94(0.97,3.89) |
| Hispanic | 1.28(0.82,2.01) | 0.65(0.35,1.21) | 0.48(0.27,0.84) |
| Race | | | |
| White | 1.00 (ref) | 1.0 (ref) | 1.00 (ref) |
| Black | 0.83(0.53,1.32) | 1.02(0.46,2.27) | 0.33(0.17,0.64) |
| Asian | 0.95(0.39,2.29) | 3.64(0.78,17.01) | 0.79(0.27,2.27) |
| Other | 1.47(0.78,2.78) | 1.04(0.45,2.36) | 0.70(0.32,1.55) |
| More than one race | 1.65(0.95,2.85) | 1.54(0.73,3.25) | 0.87(0.45,1.66) |
| Some college | 0.76(0.53,1.09) | 0.95(0.63,1.42) | 0.96(0.63,1.46) |
| State of residence prior to BMT | | | |
| South | 1.00 (ref) | 1.0 (ref) | 1.00 (ref) |
| Northeast | 1.23(0.78,1.95) | 1.39(0.79,2.44) | 0.98(0.57,1.68) |
| Midwest | 1.25(0.84,1.86) | 0.97(0.61,1.53) | 0.92(0.57,1.48) |
| West | 0.82(0.55,1.24) | 1.10(0.67,1.80) | 1.06(0.64,1.75) |
| Model 2: Tobacco Use Predictors | | | |

| | | | |
|---|-------------------------|-------------------------|-------------------------|
| Pre-BMT smokeless use | 1.26(0.75,2.10) | 0.96(0.66,1.39) | 4.59(2.71,7.77) |
| Pre-BMT cigar use | 2.62(1.75,3.91) | 1.04(0.73,1.49) | 1.58(1.04,2.41) |
| Dual use (2 products) | 0.95(0.53,1.68) | 1.17(0.81,1.70) | 4.94(3.04,8.05) |
| Model 3: Intrapersonal Predictors | | | |
| Intentions to Use Tobacco After Technical Training | 1.42(0.99, 2.01) | 1.73(1.23, 2.43) | 2.04(1.38, 3.01) |
| Will use product that claims to be safer than cigarettes | 1.98(1.06,3.72) | 1.16(0.75,1.79) | 2.90(1.71,4.93) |
| Will use tobacco to help me meet weight standards in the military | 2.79(1.33,5.87) | 1.40(0.81,2.44) | 1.34(0.71,2.52) |
| Tobacco restrictions in training promote abstinence | 0.82(0.72,0.94) | 0.81(0.69,0.95) | 0.86(0.73,1.01) |
| Own cigarette branded merchandise | 2.98(1.35,6.56) | 1.36(0.62,2.99) | 1.17(0.53,2.59) |
| Model 4: Interpersonal Predictors | | | |
| Peer Tobacco Use | 1.38(1.17,1.62) | 0.87(0.72,1.06) | 1.66(1.34,2.06) |
| Military Training Instructor Tobacco Use | 0.95(0.80,1.14) | 0.86(0.72,1.02) | 1.05(0.86,1.29) |
| Lived with Tobacco User Prior to BMT | 1.03(0.76,1.40) | 1.38(0.97,1.96) | 1.52(1.06,2.18) |

Notes. Odds Ratios p <.10 are highlighted in bold.

Table 3. Final Multivariate Models: Demographics, Intrapersonal and Interpersonal Variables Predicting Cigarette Smoking (significant at p < 0.05)

| | Initiators vs. Never Users OR (95% CI) | Re-Initiators vs. Former Users OR (95% CI) | Re-Initiators vs. Initiators OR (95% CI) |
|---------------------------------|--|--|--|
| Over 21 | 0.74(0.49,1.11) | 0.80(0.51,1.25) | 1.60(0.94,2.71) |
| Male | 1.64(1.08,2.49) | 0.98(0.62,1.57) | 0.50(0.29,0.87) |
| BMI | 0.96(0.90,1.02) | 0.89(0.82,0.97) | 0.95(0.87,1.05) |
| Married | 0.59(0.31,1.13) | 0.99(0.56,1.76) | 2.16(0.95,4.91) |
| Hispanic | 1.41(0.87,2.27) | 0.76(0.39,1.46) | 0.60(0.31,1.17) |
| Race | | | |
| White | 1.00 (ref) | 1.0 (ref) | 1.00 (ref) |
| Black | 1.02(0.62,1.67) | 1.53(0.66,3.58) | 0.55(0.25,1.21) |
| Asian | 1.40(0.57,3.45) | 4.41(0.89,21.79) | 1.58(0.48,5.23) |
| Other | 1.95(1.02,3.74) | 0.95(0.40,2.27) | 1.04(0.42,2.57) |
| More than one race | 2.02(1.14,3.57) | 1.43(0.66,3.12) | 0.71(0.33,1.55) |
| Some college | 0.79(0.54,1.15) | 1.01(0.66,1.55) | 1.18(0.73,1.92) |
| State of residence prior to BMT | | | |

| | | | |
|---|-------------------------|------------------------|------------------------|
| South | 1.00 (ref) | 1.0 (ref) | 1.00 (ref) |
| Northeast | 1.25(0.77,2.01) | 1.57(0.86,2.86) | 1.03(0.54,1.96) |
| Midwest | 1.18(0.78,1.80) | 1.03(0.64,1.68) | 0.98(0.55,1.72) |
| West | 0.82(0.53,1.26) | 1.15(0.68,1.94) | 1.38(0.76,2.52) |
| Pre-BMT smokeless use | -- | -- | 2.37(1.28,4.4) |
| Pre-BMT cigar use | 1.86(1.24, 2.81) | -- | 1.27(0.78,2.07) |
| Dual use (2 products) | -- | -- | 4.63(2.74,7.84) |
| Intentions to Use Tobacco After Technical Training | 1.16(0.79,1.72) | 2.08(1.53,2.83) | 1.85(1.22,2.81) |
| Will use product that claims to be safer than cigarettes | 1.99(1.06,3.76) | -- | 2.46(1.37,4.42) |
| Will use tobacco to help me meet weight standards in the military | 2.89(1.34,6.24) | -- | -- |
| Tobacco restrictions in training promote abstinence | 0.84(0.73,0.96) | 0.79(0.68,0.93) | 0.92(0.77,1.11) |
| Own cigarette branded merchandise | 3.81(1.67,8.71) | -- | -- |
| Peer Tobacco Use | 1.16(0.97,1.39) | -- | 1.24(0.94,1.64) |
| Military Training Instructor Tobacco Use | -- | 0.79(0.66,0.95) | -- |
| Lived with Tobacco User Prior to BMT | -- | 1.23(0.84,1.82) | 1.44(0.93,2.22) |

Notes. Odds Ratios from Table 2 that were p <.10 as well as the demographic predictors were included in the final multivariate models.